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# Use of the Internet by Small to Medium Enterprises in Singapore

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**Abstract:** The fact that the Internet is attracting so much attention and that more and more people are using it indicates a huge consumer market. This serves as a strong impetus for businesses to try to benefit from it. This study investigated the use of the Internet by small to medium enterprises in Singapore. It reports on the nature of usage of the Internet, the benefits associated with using the Internet for business and explores the role of business planning, Internet planning and resourcing in the success of Internet use.

## 1. Introduction

The fact that the Internet is attracting so much attention and that more and more people are using it indicates a huge consumer market. This serves as a strong impetus for businesses to try and benefit from it. In addition, the decentralised nature of the Internet is an attractive feature for businesses. No single firm owns the Internet. Instead, all firms can connect to the Internet and share in the capitalisation costs of providing backbone services. As such, firms need not raise all the capital required to organise, implement and manage the Internet [Kambril 1995].

There are many ways for organizations of all sizes and from different business sectors to use the Internet to facilitate electronic commerce. This is due to the Internet's current size and future growth prospects, and 'its ability to facilitate the global sharing of information and resources, and its potential to provide an efficient channel of advertising, marketing and even direct distribution of certain goods and information services' [Hoffman & Novak 1995].

However, despite the volume of literature advocating the benefits of using the Internet there are some concerns that could influence its success. One of the most pressing concerns is the lack of security. This is clearly reflected in user perceptions about security with potential customers very concerned about conducting financial transactions online [Gupta 1995]. As a result, the lack of security serves as a primary reason for not buying on the Web. Consumer risks also exist because of the fact that the Internet is not controlled by any single legal authority, leading to variance and inconsistencies in laws that affect consumer purchases. Finally, the fact that there is so much information available on the Internet implies that locating relevant and timely information can become a problem. Though web database search engines can help resolve this problem to some extent, much still needs to be done. However, instances of the Internet's inadequacies such as these do not seem to hinder its growth in popularity, and the Internet is potentially too valuable a business tool to deter active usage.

Little research has been done about the impact of the Internet on small to medium enterprises (SMEs). Small businesses have traditionally been perceived as unable to afford the entry costs of electronic commerce [Murchland 1995]. However, the Internet may allow small companies to compete in a business environment where traditionally they have been strategically compromised by their limited resources. [Dou 1996] compared the use of Internet by small businesses in France with those in the United States. He acknowledged that the Internet enables 'information democratisation' where firms of all sizes can diffuse and access the same kinds of information on the Internet. Poon and Swatman undertook a series of studies on SMEs in Australia [Poon & Swatman 1996a] [Poon & Swatman 1996b] [Poon & Swatman 1996c] [Poon & Swatman 1997]. They found that the Internet was mainly being used for publicity and advertising and concluded that the Internet, while not being a 'silver bullet' that can solve all problems faced by small businesses, can still offer 'a relatively cheap, accessible and effective means of communicating ideas and information to trading partners, prospective customers and to rivals' [Poon & Swatman 1996c].

Although much has been written speculating on the potential benefits of using the Internet for business, relatively few empirical studies have addressed the impact of using the Internet on SMEs or considered what factors might contribute to success in using the Internet for electronic commerce. Singapore provides an interesting context in which such a study can be conducted. The country has been consistently ranked 2nd in terms of world economic competitiveness from 1994 to 1997 [Institute for Management Development 1997]. It also has a modern information technology infrastructure and strong government support for nurturing the use of the Internet. This study was designed to determine the nature of Internet use by SMEs in Singapore and to explore factors that might contribute to successful use. In particular the roles of business planning, Internet planning and resourcing on successful business use of the Internet are examined.

## **2. The Survey**

The survey was conducted by questionnaire. The questionnaire contained 34 questions and was divided into 3 parts. The first part gathered background information on the SMEs. The second part was to be completed by SMEs that were using the Internet on a regular basis and included questions to investigate the nature of this usage. The final part of the questionnaire was to be filled out by SMEs that were not using the Internet regularly and was designed to elucidate the reasons why.

Questionnaires were sent out via e-mail to 644 SMEs in Singapore. This sample of SMEs was obtained from the SGConnect Web site which contains the details of businesses, many of them small to medium sized, operating in Singapore. All participants were promised a summary of the findings of the study as an incentive to participate. A reminder was sent to all SMEs that had not returned the questionnaire 3 weeks after the initial distribution and collection of questionnaires ceased a week later. A total of 91 questionnaires were returned giving a response rate of 14.1%.

Responses were received from businesses ranging in size from 1 to 250 employees with a median size of 10 employees. The small size of many of these businesses reflects how accessible the technology required for business use of the Internet has become and is consistent with a study by Poon and Swatman in which 65% of the SMEs responding to their survey had less than 15 employees [Poon & Swatman 1996c].

## **3. Internet Usage Profiles**

A total of 81 (89%) respondents indicated that their organizations were using the Internet on a regular basis. [Tab. 1] shows the number of these organizations using each of the main Internet applications, the length of time for which the applications have been used, and the mean satisfaction ratings with the Internet applications. Organizations that were not using the Internet regularly for business purposes are not included in the results of this paper. Electronic mail was found to be the most commonly used application (used by all organizations that use the Internet regularly) and the WWW was used by 90.1% of those that use the Internet regularly. FTP (48.1%) and Newsgroups (30.9%) were used by fewer organizations. However it is possible that some of the organizations use the WWW to conduct e-mail, download files using FTP and to access Newsgroups since the latest web browsers have these capabilities built in. If this was the case, the number of organizations who use FTP and access Newsgroups may be higher than was indicated by the results.

[Tab. 1] also shows that Internet use is relatively recent, with the average period of use being only about a year and the maximum period about 2 years. This reflects the fact that Internet usage has grown dramatically in Singapore over the last few years. This is consistent with results from other countries. For example, in an international survey conducted by [Cockburn & Wilson 1996] the dramatic growth of Internet use by businesses was also evident.

Respondents were also asked to rate their level of satisfaction with each of the Internet applications their organization used on a Likert-type scale where 1 was labeled 'not satisfied' and 5 was labeled 'very satisfied'. Respondents appeared to be relatively satisfied with their usage of all the Internet applications. In particular, they were most satisfied with electronic mail (4.23) and least satisfied with Newsgroup access (3.27) (see [Tab. 1]). The results suggest that Internet usage is not a difficult activity for most SMEs to satisfactorily achieve.

Although only 27% of the organizations that responded to the questionnaire had information systems departments, 62% had personnel whom they considered to be relatively well experienced in using the Internet.

Internet application	Number (%) using	Length of usage (months)			Mean satisfaction rating
		Mean	Min.	Max.	
Electronic Mail	81 (100.0)	13.9	2	50	4.23
WWW	73 (90.1)	12.2	1	48	3.86
FTP	39 (48.1)	13.5	3	48	3.74
Newsgroups	25 (30.9)	13.7	1	48	3.27
Other	12 (14.8)				

**Table 1:** Internet application usage patterns for those businesses that use the Internet regularly for business related purposes

Cockburn and Wilson identified the main purposes for business use of the Internet as: publicity, marketing and advertising; direct online selling; searching for and collecting information; and communication (including inter-organizational collaboration) [Cockburn & Wilson 1996]. [Tab. 2] shows the purposes for which the SMEs in this study used the Internet. It makes use of Cockburn and Wilson's categories. Communication with other businesses (93.8%) was the most frequently cited use of the Internet. This was followed by publicity, marketing and advertising (72.8%). Only a relatively small number of businesses were using the Internet for online selling (25.9%).

Purpose of Internet use	Number using	(%)	Mean effectiveness rating
Communication with other businesses	76	93.8	4.11
Publicity, marketing and advertising	59	72.8	2.97
Searching for information	38	46.9	3.71
Online selling of goods/services	21	25.9	3.00

**Table 2:** Purposes of Internet use of those businesses that use the Internet regularly

Respondents were also asked to indicate how effective they found the Internet for the purposes for which they were using it by rating its effectiveness for each purpose on a Likert-type scale where 1 was labeled 'not effective' and 5 was labeled 'very effective'. Respondents found communication with other businesses to be the most effective Internet use (4.11). This was followed by use of the Internet to gather materials (3.71).

Heavy use of the Internet as a communication and advertising medium is evident from the results of this survey. This is consistent with the results of other research (e.g. [Cockburn & Wilson 1996] [Poon & Strom 1997]). Direct online selling is still in its infancy in Singapore, with only approximately a quarter of the respondent organizations using the Internet for this purpose and with a relatively low effectiveness rating from those who did undertake it (3.00). It is possible that lack of security is a deterrent to online selling. Previous research has found that many consumers are still not comfortable with sending sensitive information (e.g. credit card numbers) over the Internet [Gupta 1995], and hence some companies are not asking them to do so [Cockburn & Wilson 1996]. This reflects the need to continually develop technologies that can provide more security for transactions over the Internet. Although the Singapore government has taken some steps to address this problem (e.g. Nettrust - Singapore's first certification authority for Internet commerce), it is possible that the effects of these initiatives have yet to be fully felt by SMEs. However that fact that the proportion of respondents conducting online selling in Singapore is greater than that found in Cockburn and Wilson's international study in 1996 suggests that electronic commerce over the Internet is gradually growing.

#### 4. Benefits of Using the Internet

The majority of organizations that used the Internet regularly (72 organizations or 88.9%) believed that the use of the Internet was beneficial to their business. They felt that the major benefit from using the Internet was the increase in public awareness of the goods or services the company was selling (59.3%). This is consistent with the heavy use of the Internet for advertising. Other frequently cited benefits were the saving of time (54.3%) and a reduction in operating costs (43.2%) (see [Tab. 3]). The costs of advertising through the Internet and communicating through it are substantially less than the costs of conventional advertising and communication. It is also possible that respondent organizations felt that using the Internet as an advertising medium is much faster than organizing advertising through other mass media as there are fewer administrative overheads.

Few of the organizations regularly using the Internet believed that Internet use had actually increased profits (17.3%) despite a belief that operating costs were reduced. [Kambril 1995] claimed that to date the Internet is used mainly to displace communication and publishing costs and that this does not result in increases in revenue. He believes that more widespread use of direct electronic transactions and innovative revenue enhancing customer services will be required before businesses experience substantial revenue growth. In this study, only one third of the organizations using the Internet regularly believed that business processes had been improved. This may result from the recency of Internet use in most of the businesses.

Benefits	Number (%)	
Increase in public awareness of goods/services the company is selling	48	59.3
Time is saved	44	54.3
Operating costs are reduced	35	43.2
Improvement in business processes	27	33.3
Profits are increased	14	17.3
Other	8	9.9

**Table 3:** Perceived benefits of using the Internet

A minority of organizations that used the Internet regularly (9 organizations or 11.1%) did not feel that they could claim there had been any benefits gained from using the Internet. The major reason for lack of confidence was that no measurement of benefits had been conducted, so they couldn't determine if any benefits had been obtained (6 or 7.4%). Newness of Internet use (3 or 3.6%), lack of experience (3 or 3.6%), and lack of hardware (2 or 2.5%) were also cited.

These respondents were also asked why they continued to use the Internet. The main reason many respondents gave was a belief that 'getting connected to the Internet is the way to go in the future'. This suggests that many businesses are afraid of falling behind in the era of electronic commerce and are eager to explore any possibilities that the Internet may offer, even if there are no immediate benefits. This pattern of behavior was also observed by [Poon & Swatman 1997] in their case studies of Australian SMEs.

#### 5. Factors that Contribute to Successful Use

It has been suggested that successful use of the Internet may depend on aligning the Internet strategy of an organization with its business strategy [Poon 1995]. In order to empirically explore the role of these factors and the role of resourcing, respondents were asked whether their organization had a business plan and an Internet plan and whether there was adequate resourcing for their use of the Internet. The results (see [Tab. 4]) show that most of the businesses that used the Internet regularly had a business plan (71.6%) and many also believed that they had adequate hardware, software and personnel resources to make effective use of the Internet (65.4%).

Over half of the businesses also had an Internet use plan that integrated proposed Internet usage with their business needs and objectives (59.3%). However only 33% of the organizations had all three in place.

It was interesting to note that SMEs were not embarking upon online selling of goods and services lightly. Online selling was the one Internet use where a majority of businesses had a business plan and an Internet plan and adequate resourcing for their use of the Internet (57% of those involved in online selling).

Possible success factor		Total	Effectiveness of publicity, marketing and advertising		Effectiveness of online selling of goods or services		Effectiveness of information searching		Effectiveness of communication with other businesses	
			number	rating	number	rating	number	rating	number	rating
Existence of a business plan	yes	58	44	3.09	18	2.94	28	3.75	54	4.09
	no	23	15	2.60	3	3.33	10	3.60	22	4.16
Existence of an Internet use plan	yes	48	40	3.20 *	17	3.12	24	3.88	45	4.29 *
	no	33	19	2.47	4	2.50	14	3.43	31	3.85
Adequate resources	yes	53	37	3.16	15	2.93	28	3.75	50	4.07
	no	28	22	2.64	6	3.17	10	3.60	26	4.19
All of the above	yes	27	22	3.64 *	12	3.17	15	3.80	25	4.28
	no	54	37	2.57	9	2.78	23	3.65	51	4.03

**Table 4:** A comparison of mean effectiveness ratings for SMEs with and without business plans, Internet use plans and adequate resourcing of Internet use.

\*  $p < 0.05$

In order to explore the role that business planning, Internet planning and adequate resourcing might play in the success of business use of the Internet a comparison was made between the effectiveness ratings of those with and those without each of the possible factors that might contribute to success. Independent samples T-tests were used to compare the mean effectiveness ratings for the different Internet uses for each of the groups.

Respondent organizations that had both business and Internet plans, and sufficient resources gave significantly higher effectiveness ratings in the area of publicity, marketing and advertising ( $t(57) = 3.68$ ,  $p = 0.001$ ) but not for Internet use for other purposes.

It appears that publicity, marketing and advertising are more effective when the organization has laid the groundwork by establishing their marketing goals, identifying how the Internet can be used to help achieve them and providing the necessary resources. It is surprising that a similar result was not obtained for on-line selling but although higher effectiveness ratings were given by those organizations that undertook business planning and Internet planning and had adequate resourcing, the difference was not significant. This may be due to the small numbers involved in on-line selling.

The fact that no significant relationship was found between any of the 3 factors and effectiveness of use of the Internet for information searching or communication with other businesses may be because these activities are relatively straightforward and lack of planning may not have such an impact. Similarly, less resources would be needed to set up e-mail for communication and web browsers for information searching than would be required to set up a web site for advertising and marketing purposes.

The existence of a plan that integrates Internet usage with business needs appears to be the most influential of these factors (publicity, marketing and advertising:  $t(57) = 2.27$ ,  $p = 0.027$ ); communication with other businesses:  $t(74) = 2.20$ ,  $p = 0.031$ ). This supports the statement made by [Poon & Swatman 1996a] that 'small business wishing to harness the Internet for sustainable strategic advantage will need to align their business

strategy with their Internet strategy'. Thus, a business plan is needed to clarify business needs and objectives, paving the way for strategic activity aimed at fulfilling the objectives. It appears that organizations wishing to harness benefits from the Internet must first recognize what their business needs are. Similarly, organizations need to have adequate resources, in terms of hardware, software and personnel, to be able to use the Internet effectively.

## 6. Conclusions

This study investigated the use of the Internet by SMEs in Singapore. It found that use of the Internet by SMEs in Singapore is a fairly recent phenomenon but one with which there is a relatively high level of satisfaction. Communication with other businesses, and publicity, marketing and advertising are the major purposes for which it is used. Online selling of goods and services was found to be still in its infancy in Singapore and security issues may have to be addressed before it becomes a dominant form of business.

The role that business planning, Internet planning and adequate resourcing might play in the success of business use of the Internet was also investigated. Organizations that had both business plans and Internet plans plus adequate resourcing rated the effectiveness of the Internet for publicity, marketing and advertising more highly than did organizations without these. This indicates that SMEs should not rush into Internet use but rather should first lay groundwork by establishing their marketing goals, identifying how the Internet can be used to help achieve them and ensuring that they can provide the necessary resources.

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